Montana Standards for Technology

Today's learners—teachers and students—are continually affected by a variety of digital technologies. These technologies have altered their expectations and skills. Traditional instruction alone no longer provides students with all the skills necessary to find personal value and professional success. Therefore, education needs to play an increasing role in empowering learners to be technologically literate and to integrate digital tools into their lives.

Expectations for student learning are increasing as digital tools make basic tasks easier. We must help students meet these expectations by understanding that:

- *digital technology must be in the hands of all students;*
- *technological literacy includes more than simple mastery of skills;*
- *digital citizens must use digital tools safely and responsibly;*
- *learning environments are no longer constrained by school walls; they are global and personal;*
- *digital technology skills are acquired, developed, and mastered at an individual pace;*
- *access to tools and flexible networks are critical for learner success.*

While digital technology tools can be used to facilitate assessment of student learning, the primary application of these tools must be used to support content area learning. Although integrated learning systems can be used to deliver curriculum, true technology integration involves dynamic interactions among learners using digital tools.

Inquiry-based learning activities, rich in relevant content and integrated with digital technology, can facilitate collaboration, critical thinking, creativity, and problem solving. Properly applied, technology enhances learning and instruction, but does not become the focus. By providing access to information and tools for expression, opening pathways to communication, and facilitating personal understanding, technology supports learning in all subjects.

Pursuant to Article X Sect 1(2) of the Constitution of the state of Montana and statutes §20-1-501 and §20-9-309 2(c) MCA, the implementation of these standards must incorporate the distinct and unique cultural heritage of Montana American Indians.

Technology Content Standard 1

To satisfy the requirements of Technology Content Standard 1, a student must: use digital tools and resources for problem solving and decision making.

Rationale

As personal and global problems become more complex, digital tools are powerful vehicles for data collection and analysis, collaboration, and presentation of solutions. Therefore, all learners must select and use digital tools to make sound, accurate, data-supported decisions and presentations.

Benchmarks for Technology Content Standard 1 for the end of grade 4

The benchmark for Technology Content Standard 1 for a student at the end of grade 4 is the ability to:

- identify and investigate a problem and generate possible solutions;
- collect data and information using digital tools;
- organize collected data and information using a variety of digital tools;
- identify the accuracy, diversity and point of view, including Montana American Indians, of digital information;
- share information ethically and note sources.

Benchmarks for Technology Content Standard 1 for the end of grade 8

The benchmark for Technology Content Standard 1 for a student at the end of grade 8 is the ability to:

- use multiple approaches to explore alternative solutions;
- collect relevant data and information on a subject from a variety of digital resources;
- analyze and ethically use data and information from digital resources;
- compare accuracy, diversity, relevance and point of view, including Montana American Indians, of digital information;
- share data and information ethically and appropriately cite sources.

Benchmarks for Technology Content Standard 1 upon graduation

The benchmark for Technology Content Standard 1 for a student upon graduation is the ability to:

- use multiple approaches and diverse perspectives, including Montana American Indians, to explore alternative solutions;
- collect relevant data and information on a subject from a variety of digital resources;
- select from an array of digital tools to organize and analyze data from a variety of resources;
- evaluate and synthesize data and information;
- share data and information ethically and appropriately cite sources.

Technology Content Standard 2

To satisfy the requirements of Technology Content Standard 2, a student must: collaborate and communicate globally in a digital environment.

Rationale

Digital tools can facilitate collaboration and communication by opening pathways to a global learning environment. All learners share the responsibility to practice and advocate the safe and responsible use of these digital tools.

Benchmarks for Technology Content Standard 2 for the end of grade 4

The benchmark for Technology Content Standard 2 for a student at the end of grade 4 is the ability to:

- identify and explore online collaboration and communication tools;
- identify and explore safe, legal, and responsible use of digital collaboration and communication tools;
- communicate the results of research and learning with others using digital tools;
- explore how technology has expanded the learning environment beyond the traditional classroom.

Benchmarks for Technology Content Standard 2 for the end of grade 8

The benchmark for Technology Content Standard 2 for a student at the end of grade 8 is the ability to:

- select and use online collaboration and communication tools;
- use digital collaboration and communication tools in a safe, legal, and responsible manner;
- communicate the results of research and learning with others using digital tools;
- use technology in a global learning environment.

Benchmarks for Technology Content Standard 2 upon graduation

The benchmark for Technology Content Standard 2 for a student upon graduation is the ability to:

- evaluate and apply online collaboration and communication tools to exchange ideas and information and participate in projects;
- use digital collaboration and communication tools in a safe, legal, and responsible manner and advocate for such use by others;
- synthesize and communicate the results of research and learning with others using various digital tools;
- apply technology that supports collaboration, learning and productivity in a global environment.

Technology Content Standard 3

To satisfy the requirements of Technology Content Standard 3, a student must: apply digital tools and skills with creativity and innovation to express his/herself, construct knowledge and develop products and processes.

Rationale

Digital tools can support creative and innovative expression, which is increasingly necessary in our changing world. The use of these tools can also facilitate the realization and fulfillment of one's talents and interests. The education community has the responsibility to provide access to the new avenues for creation and require nuanced understandings of digital citizenship and ownership.

Benchmarks for Technology Content Standard 3 for the end of grade 4

The benchmark for Technology Content Standard 3 for a student at the end of grade 4 is the ability to:

- use digital tools for personal expression;
- use various digital media to share information and tell stories;
- use technology to discover connections between facts;
- understand ownership of digital media;
- use digital tools and skills to construct new personal understandings.

Benchmarks for Technology Content Standard 3 for the end of grade 8

The benchmark for Technology Content Standard 3 for a student at the end of grade 8 is the ability to:

- apply a variety of digital tools for personal and group expression;
- use a variety of digital tools to create a product;
- use technology to recognize trends and possible outcomes;
- examine the relationship of copyright to ownership of digital media.
- use digital tools and skills to construct new personal understandings.

Benchmarks for Technology Content Standard 3 upon graduation

The benchmark for Technology Content Standard 3 for a student upon graduation is the ability to:

- develop projects combining multiple digital tools to suit a variety of audiences and purposes;
- evaluate and employ a variety of digital tools to effectively produce an original work;
- use models and simulations to identify trends, predict outcomes, and investigate information;
- evaluate legal protections for intellectual property and apply that understanding to personally created digital media.
- use digital tools and skills to construct new personal understandings.

Technology Content Standard 4

To satisfy the requirements of Technology Content Standard 4, a student must: possess a functional understanding of technology concepts and operations.

Rationale

Solely teaching application- and device-specific skills is no longer sufficient. While core computer skills are required to harness the power of digital tools, these skills need to be adaptable to the quickly changing technological landscape.

Benchmarks for Technology Content Standard 4 for the end of grade 4

The benchmark for Technology Content Standard 4 for a student at the end of grade 4 is the ability to:

- show skills needed to use communication, information and processing technologies;
- use appropriate terminology when communicating about current technology;
- transfer current knowledge to learning of new technology skills.

Benchmarks for Technology Content Standard 4 for the end of grade 8

The benchmark for Technology Content Standard 4 for a student at the end of grade 8 is the ability to:

- apply and refine the skills needed to use communication, information and processing technologies;
- use appropriate terminology when communicating about current technology;
- transfer current knowledge to learning of new technology skills.

Benchmarks for Technology Content Standard 4 upon graduation

The benchmark for Technology Content Standard 4 for a student upon graduation is the ability to:

- apply and refine the skills needed to use communication, information and processing technologies;
- use appropriate terminology when communicating about current technology;
- transfer current knowledge to learning of new technology skills.

Foundation Resources:

International Society for Technology in Education. *National Educational Technology Standards for Students.* 2nd Ed. Eugene, Oregon: ISTE, 2007.

Montana Office of Public Instruction. "Montana Content and Performance Standards for Technology." *Administrative Rules of Montana (10.54.7501)* Helena, Mont.: OPI, 2000.

Montana K-12 Technology Performance Descriptors A Profile of Four Levels

The Technology Performance Descriptors define students' knowledge, skills, and abilities in the Technology content area on a continuum from kindergarten through grade 12. These descriptions provide a picture or profile of student achievement at four performance levels: advanced, proficient, nearing proficiency, and novice.

Advanced: This level denotes superior performance. (Independently)

Proficient: This level denotes solid academic performance for each benchmark. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.

Nearing Proficiency: This level denotes that the student has partial mastery of the prerequisite knowledge and skills fundamental for proficient work at each benchmark. (Guidance)

Novice: This level denotes that the student is beginning to attain the prerequisite knowledge and skills that are fundamental for work at each benchmark. (Assistance)

Content Standard 1: Students use digital tools and resources for problem solving and decision making

Grade 4 Performance Descriptors

Advanced

A fourth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- consistently uses digital tools and resources for problem solving and decision making;
- effectively uses assigned digital tools to identify a problem;
- brainstorms ways to generate possible solutions;
- uses assigned digital tools to collect data and information from a variety of resources;
- uses assigned digital tools to organize data and information;
- effectively identifies accurate and inaccurate information;
- understands diversity and point of view, including Montana American Indians;
- identifies and notes the work of others;
- understands the concept of digital media ownership.

Proficient

A fourth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- uses digital tools and resources for problem solving and decision making;
- effectively uses assigned digital tools to identify a problem ;
- uses guided brainstorming to generate possible solutions;
- explores assigned digital tools to collect data and information from a variety of resources;
- uses assigned digital tools to organize data and information;
- differentiates between accurate and inaccurate information;
- recognizes diversity and point of view, including Montana American Indians;
- recognizes that using the work of others needs to be noted;
- explores the concept of digital media ownership.

Nearing Proficient

A fourth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, examines digital tools and resources for problem solving and decision making;
- with guidance, uses digital tools to identify a problem;
- chooses a solution from a teacher-provided list;
- with guidance, explores assigned digital tools to collect data and information from a variety of resources;
- uses an assigned digital template to organize data and information;
- with guidance, differentiates between accurate and inaccurate information;
- with guidance, recognizes diversity and point of view, including Montana American Indians;
- with guidance, recognizes that using the work of others needs to be noted;
- with guidance, explores the concept of digital media ownership.

Novice

A fourth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- demonstrates limited understanding of digital tools and resources for problem solving and decision making;
- has limited understanding of digital tools used to identify a problem;
- with assistance, chooses a solution from a teacher-provided list;
- with assistance, uses a basic digital tool to collect data and information;
- with assistance, uses an assigned digital template to organize data and information;
- has limited understanding of accurate and inaccurate information;
- has limited understanding of diversity and point of view;
- has limited recognition of the concept of using the work of others;
- has limited understanding of the concept of digital media ownership.

Grade 8 Performance Descriptors

Advanced

An eighth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- independently uses multiple approaches to explore alternative solutions;
- thoughtfully collects relevant data and information on a subject from a variety of digital resources;
- clearly demonstrates analysis and ethical use of data and information from digital resources;
- evaluate the accuracy, diversity, relevance and point of view, including Montana American Indians, of digital information;
- consistently demonstrates ethical practices when sharing data and information;
- appropriately cites sources using multiple styles.

Proficient

An eighth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- demonstrates clear understanding of multiple approaches to explore alternative solutions;
- collects relevant data and information on a subject from a variety of digital resources;
- analyzes and ethically uses data and information from digital resources;
- understands the concepts of accuracy, diversity, relevance and point of view, including Montana American Indians, of digital information;
- demonstrates ethical practices when sharing data and information;
- correctly cites digital sources.

Nearing Proficient

An eighth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, explores multiple approaches to explore alternative solutions;
- with guidance, collects relevant data and information on a subject from a variety of digital resources;
- with guidance, understands the analysis and ethical use of data and information from digital resources;
- with guidance, occasionally recognizes accuracy, relevance and point of view, including Montana American Indians, of digital information;
- with guidance, demonstrates ethical practices when sharing data and information;
- with guidance, cites digital sources.

Novice
An eighth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- has difficulty selecting approaches to explore alternative solutions;
- has limited success collecting relevant data and information on a subject from digital resources;
- has difficulty analyzing data and information from digital resources;
- has difficulty understanding ethical use of data and information from digital resources;
- has difficulty identifying accuracy, relevance and point of view, including Montana American Indians, of digital information;
- has limited success sharing data and information ethically;
- has difficulty citing sources appropriately.

Upon Graduation Performance Descriptors

Advanced
A graduating student at the advanced level in Technology demonstrates superior performance. He/she:

- independently applies multiple approaches and diverse perspectives, including Montana American Indians, to explore alternative solutions;
- independently and effectively collects relevant data and information on a subject from a variety of digital resources;
- independently explores and implements an appropriate digital tool to organize and analyze data from a variety of resources;
- routinely evaluates and synthesizes data and information;
- consistently shares data and information ethically;
- independently cites sources in the appropriate style.

Proficient
A graduating student at the proficient level in Technology demonstrates solid academic performance. He/she:

- applies multiple approaches and diverse perspectives, including Montana American Indians, to explore alternative solutions;
- consistently collects relevant data and information on a subject from a variety of digital resources;
- successfully selects from an array of digital tools to organize and analyze data from a variety of resources;
- effectively evaluates and synthesizes data and information;
- shares data and information ethically;
- cites sources in the appropriate style.

Nearing Proficient
A graduating student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, uses multiple approaches and diverse perspectives, including Montana American Indians, to explore alternative solutions;
- with guidance, collects relevant data and information on a subject from a variety of digital resources;
- with guidance, selects from a designated set of digital tools to organize and analyze data from a variety of resources;
- with guidance, evaluates and synthesizes data and information;
- with guidance, share data and information ethically;
- with guidance, appropriately cites sources.

Novice

A graduating student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- has limited success using multiple approaches and diverse perspectives, including Montana American Indians, and difficulty exploring alternative solutions;
- has difficulty finding relevant data and information on a subject from a variety of digital resources;
- has difficulty selecting digital tools to organize and analyze data from a variety of resources;
- can seldom evaluate and synthesize data and information;
- can seldom share data and information ethically;
- has difficulty citing sources.

Content Standard 2: Students collaborate and communicate globally in a digital environment.

Grade 4 Performance Descriptors

Advanced

A fourth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- independently uses digital tools to synchronously and asynchronously communicate with other age-level students outside their classroom environment;
- independently uses digital tools to collaborate with peers on projects and assignments outside their classroom environment;
- identifies and consistently uses safe, legal and responsible practices in using communication and collaboration technologies;
- shares the results of research with peers using digital presentation tools both online and in person;
- independently identifies and uses technologies that provide learning opportunities beyond the traditional classroom.

Proficient

A fourth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- uses digital tools to synchronously and asynchronously communicate with other age-level students in their classroom environment;
- uses digital tools to collaborate with peers on projects and assignments in their classroom environment;
- identifies safe, legal and responsible practices in using communication and collaboration technologies.
- shares the results of research with peers using digital presentation tools either online or in person.
- identifies technologies that provide learning opportunities beyond the traditional classroom

Nearing Proficient

A fourth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, uses digital tools to synchronously and asynchronously communicate with other age-level students in their classroom environment.
- with guidance, uses digital tools to collaborate with peers on projects and assignments in their classroom environment.
- with guidance, identifies safe, legal and responsible practices in using communication and collaboration technologies.
- with guidance, shares the results of research with peers using digital presentation tools either online or in person.
- with guidance, identifies technologies that provide learning opportunities beyond the traditional classroom

Novice

A fourth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance, uses simple digital tools to synchronously or asynchronously communicate with other age-level students in their classroom environment.
- with assistance, uses simple digital tools to collaborate with peers on projects and assignments in their classroom environment.
- with assistance, identifies core safe, legal and responsible practices in using communication and collaboration technologies.
- with assistance, shares the results of research with peers using digital presentation tools either online or in person.
- with assistance, identifies basic technologies that provide learning opportunities beyond the traditional classroom.

Grade 8 Performance Descriptors

Advanced

An eighth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- independently selects the most effective digital tools to synchronously and asynchronously communicate with other age-level students in and out of their classroom environment.
- independently selects the most effective digital tools to collaborate with peers on projects and assignments in and out of their classroom environment.
- independently uses safe, legal and responsible practices in using communication and collaboration technologies;
- independently and effectively shares the results of research with peers using a variety digital presentation tools both online and in person;
- independently and effectively uses a variety of technologies to learn beyond the scope of the traditional classroom.

Proficient

An eighth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- selects appropriate digital tools to synchronously and asynchronously communicate with other age-level students in and out of their classroom environment;
- selects appropriate digital tools to collaborate with peers on projects and assignments in and out of their classroom environment;
- consistently uses safe, legal and responsible practices in using communication and collaboration technologies;
- effectively shares the results of research with peers using digital presentation tools both online and in person;
- effectively uses technology to learn beyond the scope of the traditional classroom.

Nearing Proficient

An eighth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, selects appropriate digital tools to synchronously and asynchronously communicate with other age-level students in and out of their classroom environment;
- with guidance, selects appropriate digital tools to collaborate with peers on projects and assignments in and out of their classroom environment;
- with guidance, consistently uses safe, legal and responsible practices in using communication and collaboration technologies;
- with guidance, effectively shares the results of research with peers using digital presentation tools both online and in person;
- with guidance, effectively uses technology to learn beyond the scope of the traditional classroom;

Novice
An eighth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance, uses digital tools to synchronously and asynchronously communicate with other age-level students in their classroom environment;
- with assistance, uses digital tools to collaborate with peers on projects and assignments in their classroom environment;
- with assistance, identifies safe, legal and responsible practices in using communication and collaboration technologies;
- with assistance, shares the results of research with peers using digital presentation tools either online or in person.
- with assistance, identifies technologies to learn beyond the scope of the traditional classroom.

Upon Graduation Performance Descriptors
Advanced
A graduating student at the advanced level in Technology demonstrates superior performance. He/she:

- evaluates and independently selects digital tools to synchronously and asynchronously communicate with others outside of the formal classroom environment;
- evaluates and independently selects digital tools to collaborate with others on projects and assignments outside of the formal classroom environment;
- independently uses and advocates to others safe, legal and responsible practices in using communication and collaboration technologies;
- independently and effectively synthesizes and communicates the results of research with others using digital presentation tools both online and in person outside of the formal classroom environment;
- independently and effectively uses technology to learn and teach beyond the scope of the traditional classroom.

Proficient
A graduating student at the proficient level in Technology demonstrates solid academic performance. He/she:

- evaluates and independently selects digital tools to synchronously and asynchronously communicate with others in and out of their classroom environment;
- evaluates and independently selects digital tools to collaborate with others on projects and assignments in and out of their classroom environment;
- consistently uses and advocates to others safe, legal and responsible practices in using communication and collaboration technologies;
- effectively synthesizes and communicates the results of research with others using digital presentation tools both online and in person;

- effectively uses technology to learn and teach beyond the scope of the traditional classroom.

Nearing Proficient

A graduating student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, evaluates and selects digital tools to synchronously and asynchronously communicate with others in and out of their classroom environment;
- with guidance, evaluates and selects digital tools to collaborate with others on projects and assignments in and out of their classroom environment;
- consistently uses and with direction advocates to others safe, legal and responsible practices in using communication and collaboration technologies;
- with guidance, communicates the results of research with others using digital presentation tools both online and in person;
- with guidance, uses technology to learn and teach beyond the scope of the traditional classroom.

Novice

A graduating student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance, selects digital tools to synchronously and asynchronously communicate with others in their classroom environment;
- with assistance, selects digital tools to collaborate with others on projects and assignments in their classroom environment;
- with assistance, uses safe, legal and responsible practices in using communication and collaboration technologies;
- with assistance, communicates the results of research with others using digital presentation tools either online or in person;
- with assistance, uses technology to learn beyond the scope of the traditional classroom.

Content Standard 3: Students apply digital tools and skills with creativity and innovation to express themselves, construct knowledge and develop products and process.

Grade 4 Performance Descriptors

Advanced

A fourth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- effectively applies digital tools and skills to create and share personal expressions in a variety of media;

- independently uses digital tools creatively to produce original works uncommon for this grade level;
- applies basic rules of ownership of digital media to their own personal use;
- uses digital tools to develop new understandings by discovering the connections between facts.

Proficient

A fourth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- applies digital tools and skills to create and share personal expressions in a variety of media;
- understands basic rules of ownership of digital media;
- uses digital tools to discover connections between facts.

Nearing Proficient

A fourth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance attempts to apply digital tools and skills to create and share personal expressions in a variety of media;
- with guidance acknowledges basic rules of ownership of digital media;
- with guidance, uses digital tools to discover connections between facts.

Novice

A fourth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance attempts to apply digital tools and skills to create and share personal expressions in a variety of media;
- with assistance, recognizes basic rules of ownership of digital media;
- with assistance, attempts to use digital tools to discover connections between facts.

Grade 8 Performance Descriptors

Advanced

An eighth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- effectively applies a variety of digital tools to create a multimedia product for personal and group expression;
- independently combines digital tools creatively to produce original works that exceed expectations;
- effectively uses technology to predict reasonable trends and outcomes;
- independently applies basic rules of ownership of digital media to their own personal use.

Proficient

An eighth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- applies a variety of digital tools to create a product for personal and group expression;
- uses technology to predict reasonable trends and outcomes;
- understands the relationship of copyright to ownership of digital media.

Nearing Proficient

An eighth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- uses a digital tool to create a product for personal and group expression;
- with guidance, uses technology to predict reasonable trends and outcomes;
- explores the relationship of copyright to ownership of digital media.

Novice

An eighth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance, uses a digital tool, to create a product for personal and group expression;
- with assistance, uses technology to predict trends and outcomes;
- with assistance, begins to understand the relationship of copyright to ownership of digital media.

Upon Graduation Performance Descriptors

Advanced

A graduating student at the advanced level in Technology demonstrates superior performance. He/she:

- initiates distinguished multimedia projects combining image, text and sound to suit a variety of audiences and purposes;
- adapts digital tools to create products of a professional quality;
- independently evaluates and employs a variety of digital tools to effectively create innovative work;
- creates models and simulations to identify trends, predict reasonable outcomes, and effectively investigate information;
- independently selects the appropriate legal protections for personally created digital media.

Proficient

A graduating student at the proficient level in Technology demonstrates solid academic performance. He/she:

- develops multimedia projects combining image, text and sound to suit a variety of audiences and purposes;
- evaluates and employs a variety of digital tools to effectively produce an original work;
- uses models and simulations to accurately identify trends, predict reasonable outcomes, and effectively investigate information;

- selects, with support, the appropriate legal protections for personally created digital media.

Nearing Proficient

A graduating student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, develops multimedia projects combining image, text and sound to suit a variety of audiences and purposes;
- with guidance, evaluates and employs a variety of digital tools to produce an original work;
- with guidance, uses models and simulations to identify trends, predict outcomes, and investigate information;
- explores the appropriate legal protections for personally created digital media.

Novice

A graduating student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- develops, with assistance, a multimedia project combining image, text and sound to suit a specific audience and purpose;
- with assistance, evaluates and employs a variety of digital tools to produce an original work;
- with assistance, begins to use models and simulations to identify trends, predict outcomes, and investigate information;
- with assistance, begins to understand appropriate legal protections for personally created digital media.

Content Standard 4: Students possess a functional understanding of technology concepts and operations.

Grade 4 Performance Descriptors

Advanced

A fourth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- independently demonstrates ability to input commands and data into digital devices;
- independently identifies the appropriate digital tool to complete tasks;
- independently uses proper terminology when communicating about technology;
- independently adapts current technology skills to additional and emerging technologies.

Proficient

A fourth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- demonstrates ability to input commands and data into digital devices;
- identifies the appropriate digital tool to complete tasks;
- uses proper terminology when communicating about technology;
- adapts current technology skills to additional and emerging technologies.

Nearing Proficient

A fourth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, demonstrates ability to input commands and data into digital devices;
- with guidance, identifies the appropriate digital tool to complete tasks;
- with guidance, uses proper terminology when communicating about technology;
- with guidance, adapts current technology skills to additional and emerging technologies.

Novice

A fourth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance, demonstrates ability to input commands and data into digital devices;
- with assistance, identifies the appropriate digital tool to complete tasks;
- with assistance, attempts using proper terminology when communicating about technology.

Grade 8 Performance Descriptors

Advanced

An eighth grade student at the advanced level in Technology demonstrates superior performance. He/she:

- independently demonstrates a consistent ability to input commands and data into digital devices;
- independently identifies the best appropriate digital tool to complete tasks;
- independently uses proper terminology when communicating about technology;
- independently adapts current technology skills to additional and emerging technologies;
- teaches others proper usage and core technology skills.

Proficient

An eighth grade student at the proficient level in Technology demonstrates solid academic performance. He/she:

- demonstrates a consistent ability to input commands and data into digital devices;
- identifies the best digital tool to complete tasks;
- uses proper terminology when communicating about technology;

- adapts current technology skills to additional and emerging technologies.

Nearing Proficient

An eighth grade student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, demonstrates a consistent ability to input commands and data into digital devices;
- with guidance, identifies the best digital tool to complete tasks;
- with guidance, uses proper terminology when communicating about technology;
- with guidance, adapts current technology skills to additional and emerging technologies.

Novice

An eighth grade student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance, demonstrates an ability to input commands and data into digital devices;
- with assistance, identifies the appropriate digital tool to complete tasks;
- with assistance, attempts using proper terminology when communicating about technology.

Upon Graduation Performance Descriptors

Advanced

A graduating student at the advanced level in Technology demonstrates superior performance. He/she:

- independently demonstrates a consistent ability to input commands and data into digital devices;
- independently identifies the best appropriate digital tool to complete tasks;
- independently uses proper terminology when communicating about technology;
- independently adapts current technology skills to additional and emerging technologies;
- teaches others advanced usage and core technology skills;
- adapts existing digital tools to create and process data in innovative ways.

Proficient

A graduating student at the proficient level in Technology demonstrates solid academic performance. He/she:

- demonstrates a consistent ability to input commands and data into digital devices;
- identifies the best digital tool to complete tasks;
- uses proper terminology when communicating about technology;
- adapts current technology skills to additional and emerging technologies;
- teaches others proper usage and core technology skills.

Nearing Proficient

A graduating student at the nearing proficient level in Technology demonstrates partial mastery of the prerequisite knowledge and skills fundamental for proficiency in Technology. He/she:

- with guidance, demonstrates a consistent ability to input commands and data into digital devices;
- with guidance, identifies the best digital tool to complete tasks;
- with guidance, uses proper terminology when communicating about technology;
- with guidance, adapts current technology skills to additional and emerging technologies.

Novice

A graduating student at the novice level in Technology is beginning to attain prerequisite knowledge and skills that are fundamental in Technology. He/she:

- with assistance, demonstrates an ability to input commands and data into digital devices;
- with assistance, identifies the appropriate digital tool to complete tasks;
- with assistance, attempts using proper terminology when communicating about technology.

Montana Standards for Technology Glossary

Asynchronous Communication - Asynchronous means not occurring at the same time. Asynchronous refers to content, instruction, and communication between participants (e.g., students and teachers) that occurs at different times, the period of which may vary by circumstance, (e.g., e-mail, threaded discussions, homework, message boards).

Broad perspective - becoming a global thinker, including consideration and possible adaptation of other's views.

Collaboration Tools - Any digital tool that allows for shared input both synchronous and asynchronous (e.g., social networks, wikis, blogs, social bookmarking, forums, video conferencing, online productivity tools).

Collaborate - to work together in small groups or through collaboration tools, to exchange ideas, to develop understandings

Communication Tools - Any digital tool that allows for exchange of information and ideas both synchronous and asynchronous (e.g., email, instant messaging, forums)

Copyright - The idea that the authors of ideas, designs, and products may register their intellectual property with the government, thereby limiting the extent to which others may use and profit from, modify, or perform the protected creation. In the United States, the doctrine of Fair Use allows others to review, comment on, parody, and study copy-written materials with proper citation.

Digital Citizenship - The norms of behavior with regard to technology use. It includes online etiquette, responsible use of technology systems, information and software, safety and security.

Digital Collaboration - Using digital tools for the purpose of collaboration

Digital Environment - A virtual space that is created using digital tools for collaboration and communication.

Digital Information - written language, audio, or video accessed through digital means.

Digital Media - Any type of information in digital format, including computer-generated text, graphics, audio and animations.

Digital Presentation Tools - Tools that facilitate the sharing if information with

others, either locally or in a virtual environment.

Digital Sources - information gathered (written, audio, video) online and noted.

Digital Tools - Inclusive of all hardware and/or software. (e.g., Computers, PDA's, Personal Video Players, personal music players, Word processors, Spreadsheets, Instant messaging, web browsers, web 2.0 tools)

Ethical Use - Respecting the hardware, ownership, privacy, and use of digital tools. (e.g., respecting ownership of intellectual property, being mindful of security and passwords, giving credit to cited sources, exhibiting appropriate behavior online, acknowledging boundaries of privacy)

Flexible Networks - A network environment which adapts with changing and emerging technologies and allows the users to explore interests safely and expediently.

Functional understanding - understanding usage sufficiently to perform day-to-day classroom tasks using digital tools

Global Communication - Refers to student communication outside the traditional classroom to learn collaboratively with other students from around the world.

G**lobal Learning Environment** - digital environment that extends the learning beyond the classroom walls

Information and communication technology - "This term is used throughout much of the WORLD (added emphasis) in place of the word *technology*."

Information and Processing Technologies

- Data - data is raw. It simply exists and has no significance beyond its existence (in and of itself). It can exist in any form, usable or not. It does not have meaning of itself.
- Knowledge - knowledge is the appropriate collection of information, such that its intent is to be useful. Knowledge is a deterministic process.
- Understanding - understanding is an interpolative and probabilistic process. It is cognitive and analytical. It is the process by which I can take knowledge and synthesize new knowledge from the previously held knowledge.
- Wisdom - wisdom is an extrapolative and non-deterministic, non-probabilistic process. It beckons to give us understanding about which there has previously been no understanding, and in doing so, goes far beyond understanding itself.

Input Commands - Transferring information to a device with an expected performance result.

Intellectual Property - refers to a range of creations such as music, literature, artistic works, symbols, names, images or designs. Intellectual property law grants owners of such property exclusive rights to govern its use.

Inquiry - "Inquiry is any process that has the aim of augmenting knowledge, resolving doubt, or solving a problem."

Language Hierarchy for Performance Descriptors

- With Assistance - One to one help with step by step learning
- With Guidance - Walk away...less impact....limited input
- At proficient - no language used
- Independently - Students work on their own without guidance

Personal Responsibility - Understanding that personal actions have effects and that individuals are responsible for choices they make.

Synchronous Communication - "Synchronous" means occurring at the same time. "Synchronous" refers to content, instruction, and communication between participants (e.g., students and teachers) that occurs at the same time even though they may be in different physical locations. For example, instruction in which students and teachers are online at the same time so that a question can be immediately answered (e.g., telephone calls, face-to-face meetings, physical classrooms, chat rooms, and videoconferencing).

Technology operations - basic skills needed to operate digital hardware and software

Web 2.0 - an emerging set of technologies occurring in the World Wide Web that aims to facilitate creativity, information sharing, and, most notably, collaboration among users.